

# Last leaf fall

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NEWSLETTER OF THE BIRMINGHAM INSTITUTE OF FOREST RESEARCH



## Wood Work

Professor Rob MacKenzie, BIFoR Director



Mill Haft is rapidly filling up with scientists investigating how a wood works. They are not just measuring the trees; they are taking stream temperatures, measuring winds above and beneath the canopy, and counting as many organisms as they can find, from the microscopically small to the majestically tall. Some of this we can do with our own staff, but much depends on our emerging partnerships. We are, therefore, delighted to announce our first three visiting fellows: **Prof David Ellsworth** and **Dr Kristine Crouse**, who will join us from the forest FACE facility at the Hawkesbury Institute of the Environment; and **Dr Debbie Hemming**, who will join us from the Met Office. All three will be with us in spring/summer 2015 under the auspices of the University's **Institute of Advanced Studies**.

The biological and environmental diversity of Mill Haft is what makes it distinctive as a research woodland and site for a Free-Air Carbon Dioxide (FACE) experiment. Plans have been submitted recently to the local authority and BIFoR researchers are now racing to characterise the state of the wood now before the carbon dioxide addition begins. The BIFoR woodland is again a busy place.

A wood is not a collection of trees; it is a collection of plants and animals, including humans. In developed countries, where humans have long since interrupted aspects of the ecosystem, stewardship is essential, all the more so now that disease and environmental change put new pressures on what woodland remains. As an institute, BIFoR is acutely aware that everything, everywhere, is touched by humankind; touched, not least, by an atmosphere that will certainly contain another 40% of CO<sub>2</sub> sometime between 2050 and 2100. BIFoR FACE will alert us to the effects of this future atmospheric composition on a mature and complicated ecosystem. Other experiments, and social science and cultural investigations from the rest of the Institute, will put the results of BIFoR FACE in the wider context essential to inform sustainable management of our precious land.

## Welcome

This second newsletter describes our progress with research, university teaching, and wider engagement:

- A perspective from the Institute's Director,
- News of our landmark carbon dioxide enrichment experiment, and
- Our strongly growing network of stakeholders and collaborators.

Photographs in the newsletter are supplied by colleagues Deanne Brettle, James Levine, and Rick Thomas.

## 1-in-4

...is the chance that any single mature woodland will release, rather than store carbon (Luyssaert et al., *Nature*, 2008). So, chances are that Mill Haft is currently acting as a "carbon sponge". By adding CO<sub>2</sub> to the air surrounding patches of woodland – i.e. the BIFoR FACE experiment – we can see whether the "sponge" effect increases or decreases and so assess what chance our woodlands have to continue to store carbon in our changing atmosphere



## Mill Haft baseline characterisation

Measurements to characterise Mill Haft before the FACE experiment begins capture the biological, chemical and physical make-up of the wood above ground and below ground, in water, air and soil. Using laser scanning, detailed surveying and expert tree inspection, we now know the species, condition and exact location (to the cm!) of every tree in Mill Haft.

### Meet the team

Our growing team includes Dr Rick Thomas who is leading the experimental team and Drs Will Allwood and Ralf Weber, our tree metabolism experts. Dr Phillip Blaen will be tasked with collecting hydrological data for initial baselining and recently joining the team is Dr Alexander Poynter, who is tasked with collecting ecological data for initial baselining and developing the ecological sampling regime at the Mill Haft site.

### On-site measurements

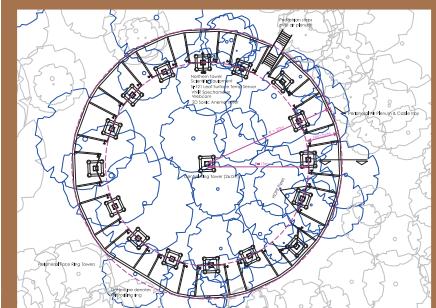
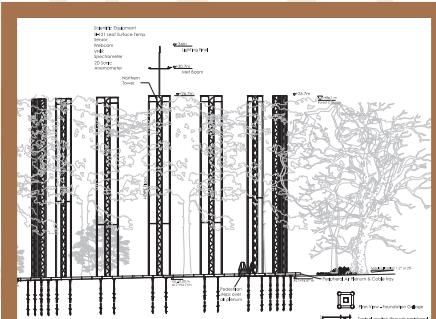
Baseline measurements have been ramping up over the summer period. We are using a temporary mast to characterize basic meteorology (wind direction, speed,

temperature, humidity) to help predict CO<sub>2</sub> requirements at the site during FACE.

Hydrological monitoring of groundwater through the boreholes is ongoing, and a geophysical survey aimed to identify subsurface aquifers has been completed.

Ralf Weber has been collecting samples for metabolic rate method development and is pictured below using forceps to mimic insect stress on a leaf prior to collection. Various methods of insect collection for identification are being trialled.

**Please contact us if you would like to be involved / can offer specialist research capability.**



## BIFoR FACE Facility Plans submitted

The University team have been busy finalising the design of the FACE facility, and a planning application was submitted to Stafford Borough Council in September. The team have worked closely with Norbury Estate, local ecologists and numerous contractors, and have taken into account feedback received following the public exhibitions held in February 2014. The resulting plan is scientifically robust and sits lightly and inconspicuously in the woodland. We hope to hear the decision before the end of the year. In the meantime, BIFoR will continue to:

- Measure the scientific "baseline"
- Progress appointment of contractors
- Talk to key stakeholders

## BIFoR's wood wide web



At the invitation of UK Trade & Industry, researcher James Levine represented BIFoR in a workshop on bioeconomy in Brazil in June 2014. As well as making useful new contacts, the visit allowed James to continue our discussions with cosmetics giant, **Natura**, on sustainable cultivation of oil palm, a key global food commodity.

Along with leading researchers from across Europe, Rob MacKenzie contributed to the production of *A scientific roadmap for projections of global change impacts on forests*, at a European COST Event in Sarajevo in August 2014.

Throughout spring/summer 2014 we have had valuable conversations with friends and advisors:

- The public via our "pop-up shop" in central Birmingham and at the British Festival of Science (shown left)
- The UK government via the Dept of Energy & Climate Change and the Food & Environment Research Agency
- The EU Joint Research Centre
- The Forestry Commission, especially via the West Midlands Forests and Woodlands Advisory Committee
- The Institute of Chartered Foresters, the Sylva Foundation, the Royal Forestry Society, and several other valuable partners
- Researchers and practitioners at conferences of the Continuous Cover Forestry Group, the British Hydrological Society, the American Meteorological Society, the Arboricultural Association, and the International Union of Forest Research Organisations

### Visit Mill Haft and Stay in Touch

If you would be interested in visiting the research site (late 2014/early 2015) in Staffordshire please contact us to express your interest in a field trip:

Email: [bifor@contacts.bham.ac.uk](mailto:bifor@contacts.bham.ac.uk)

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